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AUTHOR Richardson, James A., Ed.; Hoadley, Michael, Ed.
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ABSTRACT

This publication is designed to communicate the history and research activities of members of the Central District of the American Alliance for Health, Physical Education, Recreation, and Dance. It presents summaries of 30 papers and conference presentations on such topics as pioneering physical educators; cholesterol in college football players; physical fitness of males with disabilities; injury and self-esteem; assessment of scientific knowledge of high school coaches; intrinsic motivation; college coaches' roles and working conditions; gender differences in anaerobic power measurements; elementary health education; learning a softball pitch; physical activity of preschool age children; teaching appropriate intensity of cardiovascular exercise; relationship between employment and psychosocial factors among heart transplant recipients; on-task behaviors of college hockey players; cooperating teacher ratings of preservice physical educators; effects of training in observational proficiency; effect of blood alcohol content on reaction and movement times; energy expenditures for various forms of exercise; metabolic measurements in distance runners; effects of a required fitness class on fitness; prediction of starters in college football; effect of drafting in swimming on heart rate and lactate responses; dietary intakes of swimmers; upper body strength training for college females; relationship of body cathexis and somatotype to physical fitness; and psychological skills of college athletes. (JDD)

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ED 362 492

THE PROCEEDING OF THE ANNUAL MEETING OF THE CENTRAL DISTRICT OF THE AMERICAN ALLIANCE FOR HEALTH, PHYSICAL EDUCATION, RECREATION, AND DANCE.

APRIL 29 - MAY 3, 1992

DES MOINES, IA.

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This publication is designed to communicate the History, and Research activities of the Central District of the American Alliance for Health, Physical Education, Recreation, and Dance. The abstracts found here in, were collected from the Chairs of the afore named sections, and presented in the order in which they were received. These chairs are as follows:

History (Chair)

Kathleen Kinderfather
Harris-Stone State College,
3026 Laclede Avenue, St.
Louis, MO 63103

Research

John Zody
Fort Hays State College
Fort Hays, KA
(Past-Chair, 1990-92)

Dennis Jackson
University of Nebraska at
Kerney, Kerney, NE
(Chair, 1992-93)

James A. Richardson
Division of Health, Physical
Education, and Recreation,
University of South Dakota,
Vermillion, SD 57069.
(Chair-elect, 1993-94)

Editors

Jim Richardson, and Mike Hoadley

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History

H-1 ***WOMEN'S WORK: THE WOMEN'S AUXILIARY OF THE CONCORDIA THERNERS IN ST. LOUIS, MISSOURI.*** K. Kinderfather, Harris-Stone State College, St. Louis, MO. 63103.

The auxiliary was chartered in 1921, just one year after the 19th. Amendment to the U. S. Constitution gave that historical moment in time.

The Auxiliary supports the society, socially, monetarily and by contributing many hours of "women's work". The ladies are an extension of a male member and of the Society as a whole. The primary source materials is rich in the history of St. Louis events and recreational activities, particularly those that impact women.

Over the years there was obvious bonding between the women. They have not moved to a position of equity with the male members.

H-2 ***IOWAVES ON CAMPUS: IOWA STATE TEACHERS COLLEGE NAVAL TRAINING CENTER.*** C. Cooper, Department of Health, Physical Education, and Leisure Services, University of Northern Iowa, Cedar Falls, IA 50614-0241.

Between December 15, 1942, and April 30, 1945, more than 10,000 WAVES (Women Accepted for Voluntary Emergency Service) received training at Iowa State Teacher's College (TC) in Cedar Falls, IA. WAVES were required to have 4 hours physical training (PT) and two hours drill weekly. A typical PT program consisted of posture lectures and exams to correct defects; calisthenics resembling Swedish gymnastics, cage ball, relaxation, and singing. Since 35-50% of the women entered as non- swimmers, swimming was required of everyone. Seasonal activities were taught, and all WAVES participated in Inter-platoon competition in swimming, bowling, softball, basketball, and volleyball.

Central District Scholarly Lecture, April 30, 1992, Des Moines, IA.

S-1 ***OUR PROFESSION, FIELD OF DREAMS, FIELD OF DOERS.*** J. A. Beran, Iowa State University, Ames , IA

This address connected present professionals with pioneering physical educators in the nine state Central District. Leaders such as Jessie Bancroft, Clark Heherington, Charles McCloy, Mabel Lee, Carl Nordly, and Lou Alley worked locally as well as nationally to form our profession, to identify its contribution to the education of children and youth, and to bring sports in consort with broader educational purposes.

Their philosophies and contributions were reviewed as a framework to assess our progress toward reaching our goal to provide a quality regular physical education program that would enable all Americans to be healthy and fit.

Facts such as the growing number of at risk youth, the 1991 CDC report that 60% of the students in grades 7-12 do not get enough exercise three times a week to cause them to breathe heavily and make their hearts beat faster, and the Michigan State study that 75% of school age athletes between the ages of 12 - 14 drop out of athletics because of relentless and intense pressure from parents and coaches to win were cited. Identifying the pioneer physical educators, by their example, would challenge us to do more than just dream about what our field can do for Americans. They would ask what we are doing to make our dreams a reality for all.

RESEARCH

R-1 ***Cholesterol in College Football Player***: J. A. Richardson, B. Fischbach, M. Stevenson, D. Marich, and L. Tentinger. Division of Health, Physical Education, and Recreation, University of South Dakota, Vermillion, SD 57069.

The purpose of this investigation was to measure the impact of physical exercise within the context of football practice and game situations on changes in total cholesterol (T-chol). The procedure employed to assay the T-chol of the athletes was the standard testing technique proscribed by the Mannheim Reflotron™ (Boehringer Mannhein, 1985). The thirty subjects were all members of the same football team and were assessed in three three day periods before, after pre-season practices, and at the end of the regular season. The results indicated that the subjects ranged in age from 19 to 22 years (m = 19.6, sd = 1.18), T-chol 1 [a] screening from 100 to 230 milligrams per deciliter [mg/dL] (m = 149, sd = 33.6), T-chol 2 [b] screening from 100 to 208 mg/dL (m = 138.3, sd = 32.1), and T-chol 3 [c] screening from 100 to 307 mg/dL (m = 167, sd = 50.42). The correlations between a vs. b was .676, between a vs. c was .735, and between b vs. c was .674. This supports the accuracy of the method of evaluating the a, b, and c. Further, there were significant differences between a, and b (6.983), and between c vs. b (3.461) at the 95% level using a two-tailed t-test. In addition, both Fisher (PLSD) and Scheffe (F-test) indicated significance between the T-chol levels in assay a and c (PLSD = 12.078, and F-test = 4.451), and b and c (PLSD = 12.078, and F-test = 11.288) at the 95% level Even though the population used in this report is small (30 subjects), there a few conclusion that can be drawn: 1. the frequency and intensity of the physical activity of the two-a-day practices may be of little or no physiological value in the control of T-chol in college age football players,2. the duration and intensity of regular the physical activity experienced during the season has a statically significant impact on T-chol levels in these subjects, 3. there appears to be a rebound of the level T-

chol as suggested by the significance of the differences between b and.c, and 4. regularity of physical activity will reduces T-chol in college age football players.

R-2 ***PHYSICAL FITNESS ASSESSMENT, AND INDIVIDUAL PROGRAMING FOR MENTALLY AND PHYSICALLY HANDICAPPED MALES***: J. A. Richardson, Division of Health, Physical Education, and Recreation, University of South Dakota, Vermillion, SD 57069, and E. Blythe, NTDC, Martin, TN.

The purpose of this evaluation was to asses the physical fitness, and develop individualized programs for 35 apparently healthy handicapped males in six sheltered workshops satellites sites in Northwest Tennessee. The assessment included: weight [wt]; resting heart rate [RHR]; resting systolic [RSBP] and diastolic [RDBP]; percent of adipose tissue [PAT];static [SF] flexibility; and dynamic [DF]. Results: The participants ranged in age from 21 to 56 years (m = 34.65, sd. =9.47). Pre-exercise evaluation was wt. ranged from 114 to 300 # (m = 159.66, sd. =38.64); RSBP ranged from 90 to 168 millimeters of mercury [mmHg] (m = 113.3, sd = 13.2); RDBP ranged from 50 to 110 mmHg (m = 73.23, sd. =14.59); PAT ranged from 4 to 32 % (m = 14.5, sd. =6.35); SF ranged from 0 to 21 inches [ins] (m = 10, sd = 5.9); DF ranged from 0 to 35 ins (m = 12.9, sd = 5.24); Post-exercise evaluation was: wt ranged from 114 to 292# (m = 159.28, sd. =37.44); RSBP ranged from 90 to 168 mmHg (m = 113.6, sd. =16.73); RDBP ranged from 50 to 110 mmHg (m = 70.4, sd. =12.12); PAT ranged from 5 to 32 % (m = 14.7, sd. =6.04); SF ranged from 0 to 21 ins (m = 10, sd. =5.9); and DF ranged from 0 to 22 ins (m = 9.7, sd. =7). Conclusions:

The participants in this study were not statically different from the non-client control group. The programing for the clients included specific suggestions based on the each assessment for the improvement of each of the areas - weight ; resting heart rate; resting systolic; diastolic; percent of adipose tissue; static flexibility; and dynamic flexibility. Even though the post test indicates no significant differences, the physiological changes expected may take a little longer to manifest themselves.

R-3 ***THE EFFECTS OF MODELING, PERCEIVED COMPETENCE, AND MOVEMENT CONFIDENCE ON INTRINSIC MOTIVATION.*** B. M.Larson, and J. E. Lidstone, South Dakota State University, Brookings, SD

The purpose of this study was to determine if modeling, perceived competence, and confidence are related to intrinsic motivation. More specifically, the study compared the intrinsic motivation of subjects who observed a skill model and subjects who observed an unskilled model. A sub-problem was to determine if perceived competence and movement confidence are related to intrinsic motivation. Eighty male college students, age 18-26 years, participated in the study. Following an initial briefing, the subjects completed the Nelson-Allen Movement Satisfactions Scale. On the day of testing the subjects were given further instruction and randomly assigned a modeling condition. After the subjects completed the Perceived Competence Scale, they observed their respective modeling condition (skilled or unskilled). At this time the subjects completed their trials on the stabilimeter. At the conclusion of their trials, the subjects completed the Task Reaction Questionnaire which measured their intrinsic motivation for the task. Data were analyzed using 2X2 factorial analysis of variance. Subjects possessing high perceived competence had significantly higher intrinsic motivation confidence had significantly higher intrinsic motivation than subjects possessing low movement confidence. Subjects possessing high movement confidence had significantly higher intrinsic motivation than subjects possessing low movement confidence. No significant difference was found in intrinsic motivation between subject who observed a skilled model versus an unskilled model. First, in order for a model to be effective the observer must identify with the model. Second, it may be that the model was un-convincing in the unskilled demonstration. A third explanation may be that these college-age male volunteer physical education students were very ego-involved with the task. Finally, it may be that modeling does not affect intrinsic motivation.

R-4 ***INJURY AND SELF-ESTEEM: A TEST OF SONSTROEM AND MORGAN'S MODEL.*** S. L. Connely, J. E. Lidstone, South Dakota State University, and K. Thornton, University of Kansas.

The purpose of this study was to determine the impact of injury on the various aspects of self-esteem identified in Sonstroem andMorgan's (1989) model. More specifically this study evaluated the effect of injury on self-esteem, physical competence, physical acceptance, and self-efficacy. 98 male college varsity football players were tested before the season began. Upon injury, an athlete became a member of the injured group and was administered the same battery of approximately 48 hours following the injury. A final administration of the tests took place when the team physical therapist determined that the injured athlete was physically ready to return to competition. At the time the athlete was injured a non-injured athlete was selected for the control group based upon similarities in pre-season scores on the dependent variables. The non-injured controls were re-tested on the same schedule as their injured counterparts. for each dependent variable a 2X3 factorial analysis of variance with repeated measures was conducted to examine group change and group differences over the course of the study. The .05 level of significance was used for all comparisons.

Results showed that self-esteem and physical acceptance were not significant treatment or treatment x time effect was observed, however, the time factor was significant indicating a total group fluctuation in physical competence. Physical self-efficacy, as expected, was most affected by injury. Significant treatment, time, and treatment x time effects were observed due to a significant drop in physical self-efficacy by the injured subjects following trauma. It was concluded that Sonstoem and Morgan's model is valid for understanding the relationship between physical self-efficacy, physical competence, physical acceptance, and self-esteem.

R-5 ***ASSESSMENT OF SCIENTIFIC KNOWLEDGE OF SELECTED KANSAS HIGH SCHOOL COACHES.*** S. Kovar, , and B. Tidwell, Emporia State

DURING A DEVELOPMENTAL MOVEMENT PROGRAM AND DAILY ACTIVITY.
T. Benham Deal, University of Wyoming.

Evidence to suggest that children seldom naturally engage in regular physical activity that is of sufficient intensity to affect cardiorespiratory health has begun to emerge in the pediatric literature (Bradfiedl, et al.; 1971, Seliger, et al.; 1974, Saris, et al., 1980; Gilliam, et al., 1981; Spurr & Reina, 1990; Alpert, 1991). The problem of this study was to examine preschool children's heart rate responses during a developmental preschool movement program and to begin building a baseline which reflects the physical activity profiles of children in a Rocky Mountain state. Eleven children between the ages of three and five years served as subjects by wearing a CIC Vantage XL heart watch during the program, as well as during after program hours until bedtime. IN the program, university students worked one-on-one with the children in a variety of movement settings. The program met for eight weeks, tow days a week for 90 minutes each session. Heart rate readings were recorded once every 60 seconds. Baseline resting and peak heart rate readings were recorded during the first six minutes of the program on randomly selected subjects. Upon completion, subjects and teachers participated in 10 minute lessons in each of the following stations: locomotion, manipulation, stability, large muscle, fitness and swimming. Following the program, the children continued wearing the heartwatches during their regular daily activity. Pre-test readings were taken during the first two weeks of the program and post-test readings were recorded during the last two weeks. The Analysis of Variance technique revealed no significant differences between pre-test and post-test measures in any of the movement settings or in the home setting. As a result, the data analysis reported in this study reflect post-test measures only. The mean group heart rate during the program was 153.42 b.p.m., range from 90 b.p.m. to 240 b.p.m. Subjects maintained a low intensity level of activity during 14% of the program, while 71% of the activity was devoted to moderate intensity levels (121-170 b.p.m.). Using the resting heart rate measure as a control, the ANOVA technique revealed a significant difference ($p<0.01$) between te resting heart rate and the subjects' heart rate in each of the movement settings. In other words, the program was successful in raising children's heart rate significantly above their resting heart rate. When the heart rate readings for all program activities were pooled differences were also found between the program and each of the activity periods at home ($p<0.01$). Even though children seem to seldom engage in moderate to vigorous physical activity during daily life, the results of this study demonstrate that children can maintain levels of physical activity that can lead to better cardiovascular health, if given the opportunity and guidance. In addition, we know have baseline data which reflect the activity patterns of per-school children in Wyoming while in a movement program, as well as during daily, spontaneous physical activity.

R-9 ***BEHIND THE WHISTLE: COLLEGE COACHS' PRESPECTIVES OF COACHING ROLES AND WORKING CONDITIONS.*** K. S. Booker, and T B. Steen, University of North Dakota.

Largely influenced by spots media, popular conceptions of coaching are often incomplete and biased. Research on coaching has tended to focus on techniques and behaviors; only a few studies have examined coaching from the perspective of coaches themselves (Hastings, 1987; Sage, 1987; Sage, 1989). The goal of this study is to investigate the roles and working conditions of college coaching, as perceived by coaches themselves.

Eight coaches were selected as subjects via a purposeful sampling strategy (Patton, 1980) which used three variables found to be influential in previous research: level of responsibility, family status, and funding support. In depth interviews were conducted with each coach; data were collected in the form of notes and transcripts of interview audio-tapes. Follow-up interviews were used to verify emerging themes and to rise new questions. Analysis was conducted inductively using a content anaysis (Teach, 1990) to discover common patterns.

The results indicated that all eight subjects had four responsibilities in common: recruiting, public relations, academics, and finances. The majority felt internal conflict between head and assistant coaches over differing philosophies, and all reported some conflict with athletic administration. These coaches viewed time management as one of their major concerns; role conflict was greatest for married coaches with families. Long hours was the most negative part of their work; watching athletes grow, and mature was what they reported as the most satisfying part of coaching. The results suggest that popular conceptions of coaching as glamorous and autonomous are mainly myths. The results also suggest that the educational outcomes of athletics may mean more to college coaches than commonly thought.

R-10 ***GENDER DIFFERENCES IN ANAEROBIC POWER MEASUREMENTS.*** J. L. Mayhew, D. A Bemben, Northeast Missouri State University; M. G. Bemben, Kirksville College of Osteopathic Medicine, Kirksville, MO.; D. M. Rohrs, Michigan State University, East Lansing, MI; P. C. Salm, Valparaiso University, Valparaiso, IN.

The purpose of this study was to determine the difference between men and women in the generation of anaerobic power. Members of a required fitness class (100 men; 100 women) were randomly selected and tested for anaerobic power, isometric strength, and body compostion. Power was determined from the Margaria-Kalamen test (M-K), the Lewis power jump (LPJ), and a sprint power equation (SP). Additional power performances included the 40-yd dash (R40), vertical jump (VJ), and standing long jump (SLJ). Body coposition was measured via the Jackson-Pollack generalized skin fold equation. Other morphological variables included hip, mid-thigh, and calf circumferences and muscle-plus-bone cross-sectional area (CSA) of the thigh and calf. Isometric strength was determined from right and left grip, back, and leg strengths. Men were significantly different from women on 15 of 16 variables measured. Discriminate analysis indicated that maximal differences in power between sexes could be explained by LBM, %fat, and total strength. These variables were therefore used as co-variants in an ANCOVA design to determine gender differences in each power performance. Despite accounting for the differences between the sexes on these variables, men

University, Emporia, KA 66801-5087.

The purpose of the study was to assess the scientific knowledge of current Kansas high school head coaches who boys football, basketball and track, and girls volleyball, basketball, and track. Coaches participated in the study as a result of their school being randomly selected from the 369 public high schools in Kansas. The coaches completed a coaching knowledge test an a demographic questionnaire. Of the 120 schools selected, 97 agreed to participate and 70 actually returned the questionnaire and test completed by respective head coaches.

Scores on the 100 item test ranged from 25 to 99. The mean score was 71. Only 10% of the coaches scored 80 or above, while 61% scored 70 or above. To analyze what variables predicted the test scores of the coaches, a multiple resgression analyasis was completed using the test score as the dependent variable and eight independent variables identified on the demographic questionnaire. The regression analysis indicated no significant predictor variables ($F = 1.85$, $p < .07$). Only six percent of the variance in the test scores was accounted for by the independent variables, mostly by the variables age and years of coaching experience.

The research data of the study showed that the sport science knowledge of selected head coaches in Kansas may be below an standard for establishing coaching competence. The knowledge of coaches was not significantly different based on any of the demographic variables. Authorities in education and specifically coaching education contend that a person with formal training in the sort sciences should have a higher knowledge competency in the sport science than one who does not have such training. In this study, coaches trained as physical educators did not score significantly different from non-physical educators. These two findings, and other, raise several coaching education questions for Kansas and possibly for the Nation as a whole.

R-6 ***ELEMENTARY HEALTH EDUCATION STUDY: THE GAP BETWEEN STATE AND NATIONAL EXPECTATIONS AND CLASSROOM REALITY.*** C. E. Marxen

This study explores the gap between national goals for health education, the state of Minnesota's school health curriculum requirements, and reality in a sampling of Minnesota' elementary classrooms. Beginning with background information on the nation's health goals for the 1990's and the state of Minnesota's elementary health curriculum requirements and outcomes, the realities in classroom are examined through a survey of 31 Minnesota elementary teachers. Respondents in this study indicate a majority of the areas in a comprehensive health curriculum are taught, but actual classroom time devoted to health education is minimal. The concern of the researcher is that the inadequate time committed to cover each of the areas in a comprehensive health curriculum will lead to cursory knowledge. State and national health goals and outcomes will not be attainable in the 1990's unless more quality time is spent on health education in classrooms. Recommendations to narrow the gap between the health goals of the nation, the required offerings and outcomes of the state of Minnesota, and the classrooms are included.

R-7 ***SPEED-ACCURACY FACTORS IN THE LEARING OF COMPLEX SPORTS SKILL: THE WINDMILL SOFTBALL PITCH.*** R. Engelhorn, Iowa State University

Learning motor skills that require both speed and accuracy for optimum performance present many problems for both the learner and the instructor. It was the purpose of this research to investigate the effect of emphasizing speed or accuracy on the learning and performance of a high speed-high accuracy skill, the fast-pitch softball pitch. Twenty-six 10 and 11 year old girls were randomly divided into tow instructional groups. Girls received feedback related to either speed of throwing or accuracy of throwing throughout the training period, which consisted of 12 - ninety minute sessions over a six week period. During each practice session, two 10 throw tests were performed with each participant so that progress with either the accuracy of the pitching or the velocity of the pitching could be assessed. Speed and accuracy measurements were made and recorded on all participants during each practice session, and in addition, a video tape record of their pitching technique was also made at each session so that modificaitons in their technique could be assessed. All participants were taught appropriate pitching and throwing techniques, regardless of their instructional group. Speed feedback during testing was provided with a JUGS radar gun, while the accuracy groups received feedback related to their hitting a target. The speed group did not throw at the target during their testing trails. After the six weeks of practice and testing, a final round of tests were performed using the testing format for the other groups, ie., the speed group threw at the target and the accuracy group threw for speed. The speed and accuracy data for the initial week, the sixth week, and th reverse testing condition were subjected to 2X3 (2 groups by 3 testing times) repeated measures ANOVA's. The ANOVA for the speed data indicated a significant testing time effect, $F(2, 46) = 52.38$, $p<.001$, and a group by testing time interaction, $F(2,46) = 9.33$, $p<.001$. The two groups, which were randomly formed, differed in throwing speed after just one day of practice, as reflected in the pre-test data, and this difference was constant through the sixth week of testing. However, when the accuracy constraint was removed for the final testing, the accuracy group was able to throw almost as fast as the speed groups. An ANOVA for the accuracy data indicated that there were no significant differences related to target accuracy. In addition to the speed and accuracy measures, there were significant technique differences between th groups during testing. The speed group threw faster and with better technique throughout the study, and was able to maintain their speed and accuracy when the reverse test condition was used. The accurate. As a result the accuracy group more slowly, with poorer technique, and with no more accuracy than the speed group. These results suggest that it is important to not impose accuracy constraints on learners in speed-accuracy tasks until the technique is well learned. Concern for accuracy in these tasks hinders the developement of technique and significiantly affects the performance of both speed and accuracy goals. Strategies for teaching high speed-high accuracy skills are proposed.

R-8 ***COMPARING THE PHYSICAL ACTIVITY PATTERS OF PRESCHOOL AGE CHILDREN***

produced significantly greater ($p<0.05$) power in the M-K, SP, VJ, R40, and SBJ but not in the VJP. Factors other than muscle mass and strength determined anaerobic power differences between men and women.

R-11 ***A COMPARISON OF TWO METHODS OF TEACHING APPROPRIATE INTENSITY OF CARDIOVASCULAR EXERCISE: MANUALLY MEASURED HEART RATE AND PERCEPTION OF EXERTION.*** K. L. Entzion, & J. R. Whitehead, University of North Dakota.

The purpose of this study was to compare two methods of teaching appropriate intesnsity for cardiovascular exerciwe. These methods utilized either self-taken manually measured heart rates (MMHR) or individual perceptions of rate of exertion (RPE). Specifically, the primary purpose was to compare MMHR and RPE methods. A secondary purpose was to evaluate the accuracy of MMHR count. Subjects (28 females aged 18-35) were randomly assigned to the MMHR or RPE groups. Actual HR for both groups was recorded and stored using *PolarPuls* HR monitors which wre covered so that the subjects were not aware of their true HR. MMHR subjects were asked to exercise at 60-70% of their heart rate reserve as determined by the Karvonen formual. RPE subjects were asked to maintain a level of RPE that a pilot study had shown to produce a similar HR intensity. Both groups completed five 15-30 minute exercise sessions over a two week period. Using the percentage of time that HR was in the appropriate zone as a dependent measure, a 2X5 (Group X Time) ANOVA with repeated measures on the second factor was computed. There were no significant effects for Group, Time, or Group by Time interactions. The actual mean percentages of exercise time in the 60-70% zone ranged from 31-41% for the MMHR group, and 23-35% for the RPE group. The mean percentages of time in the ACSM-recommended 50-85% range were substantially higher (MMHR 74-89%, RPE 72-86%). Because missing data precluded a full repeated measures analysis, paried *t*-test (Bonferroni adjusted alpha = .01) were used to compare MMHR to actual HR values for each of the five exercise sessions. Heart rates were significantly underestimated (by 13 per min.) in session one ($t = 3.26$, $p<.01$). In summary, there were no differences between teaching methods with both resulting in low to moderate success at achieving an exercise intensity of 60-70% of heart rate reserve (but good success at achieving the ACSM 50-85% range. MMHR counts taken in intitial exercise sessions should be treated with caution since they appear to significantly underestimate actual HR.

R-12 ***MULTIPLE ROLE DEMAND OF THE COACH/TEACHER AT THE COLLEGIATE LEVEL.*** B. J. Entzion, M. A. Parker, T. B. Steen, & P. A. Warcap, University of North Dakota.

The dual position of teacher/coach requires an individual to occupy two divergent roles in which incompatible expectations may exist. The mere perception of incongruous expectations can result in role conflict (Massengale, 980). Acknowledgement of this conflict, whether perceived or experienced, indicates that there is a problem. The purpose of this study was to assess the the extent and intensity of selected role conflicts encountered by coach/teachers at the university level and to determine the degree to which selected variables were associated with the actual conflict. Male and female coach/teachers (N = 235, 171 male, 64 female) from NCAA Division II & III and NAIA Division I & II schools completed questionnaires on which they rated the perceived and experienced intensity of conflicts in the fulfillment of their dual roles. Locke and Massengale's (1978) Coaching Problem Survey provided the basis for the development of the instrument. The questionnaire was designed to assess perceived and experienced conflicts in five selected areas: values conflict, status conflict, self/other conflict, load conflict, and teacher/coach conflicts. Teacher/coaches were asked to complete the ten question inventory twice, once on the basis of whether these areas seemed to be a problem and the second time in relation to personal experience with the problem. Separate MANOVAs were calculated to determine if differences existed between responses based upon perceived and experienced conflict and effect of level of coaching division (NCAA II or III, NAIA I or II), future aspirations, and gender. Significant differences were noted for perceived conflict in relation to coaching division F (25, 826) = 1.85, p = .007 and gender F (5, 224) = 3.71, p = .003. MANOVAs also revealed significant differences in experienced conflict for coaching division F (25, 822) = 1.73, p = .015 and future aspirations F (45, 973) = 1.73, p = .002. Univariate analysis indicated that load was the most experienced conflict; while status was the most perceived conflict. Means indicated that women experienced these conflicts to a greater degree than men.

R-13 ***THE RELATIONSHIP BETWEEN EMPLOYMENT AND PSYCHOSOCIAL FACTORS AMONG HEART TRANSPLANT RECIPIENTS.*** Dalen. M. Duitsman, and Charles M. Cychosz, Iowa State University, Ames, IA.

This study was designed to investigate the relationship between employment and selected psychosocial factors in heart transplant recipients. A total of 132 heart transplant recipients form five medical centers participated in the study. A questionnaire was used to determine employment status and evaluate the psychosocial variables. Variables were: Employment, Self-esteem, Identity, Stability, Pre-occupation with self, Control over destiny, Independence versus dependence, Depression, Anxiety, and Body image. A multiple analysis of variance (MANOVA) was used to explore wether the four employment status groups (employed, not-employed, retired, and disabled) differed on the psychosocial attributes. Chi-squares were computed for employment and rejection and infection to explore the possibility of physical health as a determinant of employment. Univariate F-ratios showed significant differences for all psychosocial variables except Anxiety and Pre-occupation with self. It appears that employment has a potent relationship with a number of important psychosocial factors. The disabled group displayed significantly higher scores on the psychosocial variables than the not-employed group group. It may be that the disabled group has a more socially accepted identity than the not-employed.

R-14 ***RELATIONSHIPS AND PREDICTIVE ABILITY OF COOPERATING TEACHER' RATINGS OF PRESERVICE PHYSICAL EDUATORS AND STUDENT TEACHING GRADES.*** Sherry L. Folsom-Meek, University of Missouri-Columbia.

The capstone experience of undergraduate teacher education is student teaching. Two important mentors for the student teacher as the university supervisor and the cooperating teacher, who tends to exert a greater influence than does the university supervisor (McKntrye, 1984; Yee, 1969). The summative evaluation, which serves as the basis for the student teaching grade, is commonly conducted by the cooperative teachers are interested in results of student teaching and recommendations from significant others in the teacher education program. Because student teaching evaluation summaries commonly are not included in prospective teachers' placement files, the relationship of summative evaluations to student teaching grades is of interest. The purpose of this study was to determine the relationships between and among evaluation factors and student teaching grades, and to determine which factors of the evaluation instrument best predict student teaching grades. Subjects were 31 pre-service physical educators enrolled in student teaching, and 62 cooperating teachers. All pre-service completed both secondary and elementary student teaching during the same semester. The evaluation instrument utilized was the Missouri Performance Based Student Teacher Evaluation (PBSTE), which was completed by te cooperating teachers at the end of each student teaching experience. The PBSTE contains four sub-composites: (a) instructional process, (b) classroom management, (c) interpersonal relationship, and (d) professional responsibilities. Data were analyzed on an IBM 4381 mainframe computer using SAS statistical software. Results of inter-correlation analyses yielded the following significant relationships ($r > .36$): (a) between student teaching grades and two elementary sub-composit scores, (b) between secondary sub-composite scores - 3/6 items, (c) between elementary sub-composite scores - 6/6 items, and (d) among secondary and elementary sub-composite scores - 2/16 items. With student teaching grade as the dependent variable, forward stepwise multiple regresssion analyses were performed separately for secondary and elementary PBSTE sub-composite scored predictor variables. Results indicated that for secondary student teachers, two sub-composite scores, professional responsibilities and classroom management, were the best predictors ($R^2 = .11$) of student grades. For elementary student teachers, the four sub-composite scores formed the best model for predicting student teaching grades ($R^2 = .30$). Based on the results with this sample of student and cooperating teachers, it can be concluded that the PBSTE is a more comprehensive predictor of student teaching grades at the elementary than at the secondary level. Implications suggest closer monitoring and more input by university supervisors with pre-service and cooperating teachers at the secondary level, and teaching cooperating teachers at the secondary level to observe and recored student teacher behavior on a consistent basis to obtain formative data.

R-15 ***TASK CLARIFICATION TO INCREASE ON-TASK BEHAVIORS OF COLLEGE HOCKEY PLAYERS IN AN ATHLETIC ENVIRONMENT.*** C. M. Peterson & M. A. Parker, University of North Dakota.

It is well documented that proper application of therapeutic modalities will optimize recovery time of athletic injuries (Arnheim, 1989). There is a problem in the college sports world of athletes not attending morning treatment sessions, and adhering to rehabilitation protocol. The purpose of this study was to examine the effects of task clarification, shown by Crowell, Anderson, Able, andSergio (1989) to be effective, toward increasing on-task behavior, of Division I college hockey players. The intent of the study was to increase the athletes attendance of moring treatment sessions. The subjects were 10 NCAA Division I hockey players at a midwestern university. All were members of the same team, who sustained a significant injury during the observation time of the four week study. A reversal design (ABAB) (Twaney & Gast, 1984) was used. The dependent variable was the attendance rate of the athletes to morning treatments, the independent variable was the issuing of an appointment card for the morning treatment. Each card contained the athletes name, the date and time of the treatment, the injury, and the treatment to be administered. The results showed that the baseline (A) attendance rate ranged from 40% to 0%, or 2 of 5 to 0 of 5 athletes reporting. Attendance rate for the first intervention (B) ranged from 33% to 100%, with an average of 76.9%. During the reversal (A) the attendance dropped to 0% or 0 of 3. When the intervention was reinstated (B) the attendance rate ranged from 50 to 100% with the average of 72% for the four day period. The results indicate that an athletic trainer can significantly increase athletes attendance at morning treatments through the use of appointment cards.

R-16 ***THE EFFECDTS OF A VIDEO OBSERVATIONAL TRAINING PROGRAM ON VIDEO AND LIVE OBSERVATIONAL PROFICIENCY.***

J. Eckrich, Augustana College, Sioux Falls, SD, and Carol J. Widule, Purdue University, West Lafayette, IN.

The purpose of this study was to determine the effects of video observational proficiency. A sample of physical education majors took a pretest in a video and a live environment to assess their observational proficiency. The task was observing children batting and answering questions regarding the critical features of the movement. Thestudents were then placed into a treatment ($n = 12$) or control ($n = 11$) group. There were no differences between groups on their video or live assessment scores ($p > .05$). The treatment group then participated in a three lesson video observational training program that included factors such as developing a scanning, using focus points, and minimizing distractions. After the training was completed, all subjects took a post test in each environment to assess their observational proficiency. The data were analyzed using *t*-tests. The video training program was found to be effective in improving observational proficiency in the video environment ($p < .05$), but not in the live environment (; > .05). The treatment group took the video assessment 10 days after the last post test to assess the effects of the training on retention. A repeated measures ANOVA and post hoc analyses were used to analyze the data. There were differences ($p < .05$) between the pretest scores and

retention scores and no differences ($p > .05$) between the post test and retention scores. Within the limitations of this study, the significant difference in mean gain scores between the treatment and control groups in the video environment and lack of difference in the live environment provides evidence for the effectiveness of video observational training in developing video observational proficiency but not live observational proficiency. The practice in professional training programs of using video observational training needs to be examined further if the goal is to develop live observational proficiency.

R-17 ***EFFECT OF BLOOD ALCOHOL CONTENT ON REACTION AND MOVEMENT TIMES IN COLLEGE STUDENTS.*** B Glosier, F. C. Piper, and J. L. Mayhew, Northeast Missouri State University, Kirksville, MO 63501.

The purpose of this study was to determine the effects of different levels of blood alcohol content (BAC) on simple reaction time (RT), movement time (MT), and total response time (TRT). Twenty-five college students were assigned to consume either two, four, or six beers at 15-minute intervals. Thirty minutes following consumption of their last beer, the subjects were tested for RT, MT, and TRT on an apparatus specifically designed to simulate an automobile accelerator and brake pedal assembly. Each subject was given six trials consisting of reacting to a red light signal stimulus an moving to brake pedal. One week later subjects were tested on the same apparatus in a sober conidition. Alcohol consumption significantly slowed RT by 13% andTRT by 10%, but had no significant effect on MT. The number of beers consumed was significantly correlated with BAC. The change in RT was moderately, but significantly correlated with BAC; indicating that the higher the BAC the slower the RT. None of the other changes in response times were correlated with BAC. In conclusion, moderate consumption of beer (2 - 6 beers) adversely affects RT and may impair the abilities of the individual to stop a motor vehicle while driving.

R-18 ***OXYGEN COST AND ENERGY EXPENDITURE COMPARISON BETWEEN THE NORDICTRACK CROSS-COUNTRY SKI SIMULATOR AND THE SWHWINN AIR-DYNE***
K. Ryder, S. Wulff, and J. L. Mayhew, Northeast Missouri State University, Kirksville, MO 63501

The purpose of this study was to compare the oxygen cost and energy expenditure between a NordicTrack cross-country ski simulator and a Schwinn Air-Dyne bicycle ergometer. Twelve subjects (5 men, 7 women) were evaluated for oxygen consumption and energy expenditure via an automated open-circuit spirometry system during four five-minute sub-maximal tests on each ergometer. Heart rate (HR) was recorded via telemetered electrocardiogram during the final 15 seconds of each minute. The average of the final two minutes of each trial was used for analysis. HR was moderately although significantly related to Vo_2 (ml/kg/min) for both the skier ($r = .31$, $p < .02$), and the bikde ($r = .45$, $p < .001$). The slopes and intercepts of the regression lines for Vo_2 on HR were significantly different between the two devices. The resistance (load) was only moderately correlated for the skier ($r = .62$, $p < .0001$), but highly correlated for the bike ($r = .99$, $p < .0001$). Again the regression slopes and interceptions were significantly different for each device. At loads of less than 2.25 kg, the skier required a greater oxygen consumption than the bike. Above that resistance, however, the bike required an increasingly greater amount of oxygen consumption than the skier. Although it was difficult to compare skier and the bike as far as absolute work load was concerned, at comparable exercise heart rates, the Schwinn Air-Dyne and NordickTrack ski simulator require similar oxygen consumption values and burn approximately the same number of calories.

R-19 ***MAXIMAL AND SUB MAXIMAL METABOLIC MEASUREMENT IN TRAINED COLLEGIATE DISTANCE RUNNERS.***
Stan Johnson, and J. L. Mayhew, Northeast Missouri State University, Kirksville, MO 63501

The purpose of this study was to examine the metabolic responses of trained male college distance runners to maximal and sub-maximal treadmill ergometry. Ten members of a collegiate cross-country team were examined using open-circuit spirometry in the weeks immediately following a competitive season. The average of the last three minutes of four six-minute sub-maximal runs on a moter-driven treadmill (speeds = 174 to 255 m/min) were used to assess metabolic responses. A telemetered EKG was used to determine heart rate (HR). The oxygen cost of running was linearly related to the velocity ($r = .92$). The caloric expenditure per kilometer (kcal/km) was not significantly different across

R 19 ***MAXIMAL AND SUBMAXIMAL METABOLIC MEASUREMENTS IN TRAINED COLLEGIATE DISTANCE RUNNERS.*** S. Johnson, J. L. Mayhew, Northeast Missouri State University, Kirksville, MO 63501.

The purpose of this study was to examine the metabolic responses of trained male college distance runners to maximal and submaximal treadmill ergometry. Ten members of a collegiate cross-country team were examined using open-circuit spirometry in the weeks immediately following a competitive season. The averages of the last three minutes of four six-minute submaximal runs on a motor-driven treadmill (speeds = 174 to 255 m/min) were used to assess metabolic responses. A telemetered EKG was used to determined heart rate (HR). The oxygen cost of running was linearly related to the velocity ($r = 0.92$). The caloric expenditure per kilometer (kcal/km) was not significantly different across the four speeds ($p>0.05$) and equivalent to an average of 62 kcal/km (+/- 0.9 kcal/km). Although there was a significant relationship between HR and running velocity ($r = 0.81$), the addition of HR to velocity did not increase the predictive potential to estimate the oxygen cost of running ($R = 0.93$). Maximal metabolic parameters were nonsignificantly related ($p>0.05$) to submaximal values and indicated that individuals with higher VO_2 max values were no different in efficiency during submaximal running than those with lower aerobic capacities. It can be concluded that the oxygen cost of running is dependent on running velocity, independent of body weight, and unrelated to maximal aerobic capacity.

R-20. ***OXYGEN COST AND ENERGY EXPENDITURE DIFFERENCES BETWEEN HIGH- AND LOW-IMPACT AEROBIC DANCE ROUTINES.*** D. Kennedy, J. L. Mayhew, J. C. Bowen, L. W. Boleach, Northeast Missouri State University, Kirksville, MO 63501.

The purpose of this study was to determine the oxygen cost and energy expenditure differences between high-impact (HIA) and low-impact (LIA) aerobic dance routines. Eight female aerobics instructors with at least one year of experience performed standard routines under each condition while being monitored using an automated metabolic measurement cart and telemetered EKG. A three-minute standing rest prior to exercise provided baseline measurements of oxygen consumption and heart rate. Each aerobic routine was presented from a video tape program to insure consistency of performance. Each routine was composed of a 15-minute aerobic dance routine followed by a 5-minute standing recovery. The LIA routine was identical to the HIA routine except that the LIA routine was supplemented by carrying three-pound hand weights throughout the exercise. Net oxygen cost of exercise was calculated by subtracting the standing resting values from each exercise and recovery value. The HIA routine required significantly greater ($p<0.05$) total oxygen consumption and resulted in a 24.5% greater caloric expenditure ($p<0.05$) than did the LIA routine. The HIA routine also produced a significantly higher heart rate than did the LIA routine. It can be concluded that HIA routines require greater oxygen consumption and yield a higher cardiorespiratory stress than LIA routines despite the use of hand weights.

R 21. ***EFFECT OF A REQUIRED FITNESS CLASS ON STRENGTH, ENDURANCE, FLEXIBILITY, AND BODY COMPOSITION OF COLLEGE MEN AND WOMEN.*** A. Smorynski, M. G. Bemben, J. L. Mayhew, D. A. Bemben, J. W. Bowen, Northeast Missouri State University, Kirksville, MO 63501.

The purpose of this study was to determine the effect of a 14-week required fitness course on physical and performance characteristics of college men and women. Men ($n = 100$) and women ($n = 100$) were randomly selected and evaluated for changes in body composition (determined via skinfolds), 9-min run, sit-and-reach flexibility, 1-min situp, and 1-RM bench press. Each subject trained for two eight-week sessions using various aerobic and strength program combinations. Training sessions were three times/week for 40 minutes each. Men made significant increases in LBM and significant decreases in %fat without significantly altering body mass. Women made no significant changes in any body composition parameters. Both men and women made significant improvements in each performance variable, except for bench press/kg LBM in men ($p>0.05$). The average percent improvement for performance parameters was 9.8% for men and 13.0% for women. In both men and women, the improvements in most performance parameters were negatively and significantly related to initial fitness ($r = -0.18$ to -0.59). Women made significantly greater percent improvement in three of five performance parameters than did the men. It was concluded that a 14-week required fitness program can make significant improvements in performance parameters of college students and that women make greater percent improvements than men largely due to their lower initial fitness levels.

R 22. ***PREDICTION OF STARTERS IN COLLEGE FOOTBALL.***

J. L. Mayhew, F. C. Piper, D. Harns, and J. Ware. Northeast Missouri State University, Kirksville, MO.

Football is a game dominated by strength, speed, agility, and skill. The extent to which these fundamental components can differentiate between starters (ST) and nonstarters (NS) has received only limited attention. The purpose of this study was to determine the degree to which such factors could determine starting players on a college football team. Sixty-seven players on a NCAA Division II college football team served as subjects and were measured immediately before spring practice. Anthropometric dimensions included height, weight, lean body mass, and %fat. Strength was measured from 1-RM lifts in the bench press (BP), deadlift (DL), and squat (SQ). Vertical jump (VJ) was used to measure power from the Lewis formual. Speed was measured from electrically timed 10- adn 40-yd dashes. Flexibility was determined from the sit-and-reach test. ST were defined as those who began the Spring Game. Results showed that ST were significantly older (7.0%), taller (1.7%), heavier (6.4%), lifted more in the SQ (13.6%) and DL (8.7%), and had greater power (7.9%) than NS. There were no significant difference between ST and NS, however, when SQ, DL, and power were considered relative to body weight. Step-wise discriminant analysis selected age, height, and DL as the best items to differentiate ST from NS (Wilkes lambda = 0.60). The canonical correlation between the ST-NS dichotomy and the three variables was $r = 0.63$. These variables allowed proper classification of 15 of 19 ST (78.9%) and 38 of 48 NS (79.2%). Overall correct classification of players as ST or NS was 79.1%. The greater age of ST probably reflected greater experience, while the greater DL may have been partially related to the greater size of ST. The major factors differentiating ST from NS accounted for only 40% of the common variance, indicating that football skill-related characteristics were probably more dominant factors determining starting ability in college football. Further research should center on the skill items to define more clearly the potential of players to be first-team.

R 23. ***EFFECT OF DRAFTING IN SWIMMING ON HEART RATE AND LACTATE RESPONSES.***

Chris Williams, A. J. Johns, C. Arabas. Northest Missouri State University, Kirksville, MO 63501.

The purpose of this study was to determine the effect of drafting on the heart rate and lactate production of collegiate swimmers. Five male varsity college swimmers each performed four trials of a submaximal swim (~90% of maximal effort). Heart rate (HR) was recorded by an electronic watch immediately after each swim. Finger-tip blood samples were withdrawn two minutes after each swim and analysized for lactate (LA) using an enzymatic method. The four trials considered of each individual performing either in the lead or in the second, third, or fourth position behind another swimmer. Repeated measures ANOVA

indicated that swimming in the fourth positions produced significantly lower HR than any of the other positions. The LA responses were significantly lower when swimming in the second and fourth positions than for the lead position or third position. Therefore, it appears than drafting results in significantly lower HR and LA responses during swimming.

R 24. ***COMPARISON OF DIETARY INTAKES BETWEEN DISTANCE AND SPRINT SWIMMERS.*** M. L. Ferguson, C. Arabas, J. L. Mayhew. Northeast Missouri State University, Kirksville, MO 63501.

The purpose of this study was to compare the dietary intakes between collegiate distance and sprint swimmers. Nine distance (DS) and 12 sprint swimmers (SS) completed 3-day dietary recalls, which included two week days and one weekend day. The survey was done during the middle of a competitive season. In addition, each swimmer completed a questionnaire concerning information on meal preparation, location, and meal-skipping. Dietary profiles were completed using the Nutritionist III computer program. Independent t-tests indicated no significant differences between DS and SS in the intake of four minerals, five vitamins, total calories, and percents of carbohydrates (56.0% vs 53.8%, respectively), fats (28.9% vs 30.1%), and proteins (15.1% vs 16.1%). Men (n = 6) consumed significantly greater quantities of the four minerals and of vitamins D and K than the women (n = 15). There was no significant difference between men and women in the percents of carbohydrates (55.1% vs 54.6%), fats (29.0% vs 29.9%), and proteins (15.9% vs 15.5%) consumed, while men ate significantly more calories than women (3,105 Kcal vs 2, 150 Kcal). Despite eating most of their meals off campus, college swimmers manage to eat a low-fat, high-carbohydrate diet.

R 25. ***EFFECT OF STRENGTH TRAINING ON THE UPPER BODY POWER OF COLLEGE FEMALES.*** J. L. Prinster, M. G. Bemben, D. A. Bemben, J. L. Mayhew, Northeast Missouri State University, Kirksville, MO 63501.

This study examined the effects of a strength training program on upper body strength and power in college women. Seventeen women trained twice/week for one hour using a heavy resistance free-weight periodized strength program. Lifts included exercises for the shoulders, chest, trunk, and legs. Bench press strength (1-RM), seated shot put (SSP) performance, and bench press power (BPP) were measured before and after the 12-week program. The BPP test utilized free weights and infrared sensors attached to a digital timer with loads equivalent to 30%, 40%, 50%, 60%, 70% and 80% of the 1-RM. There were significant improvements in 1-RM bench press, SSP, and BPP at 70% and 80% of the 1-RM ($p<0.05$). The BPP values at 30% to 60% of the 1-RM were not changed significantly ($p>0.05$) after training. Correlations between 1-RM and the various BPP's ranged from $r = 0.34$ (BPP-80%) to $r = 0.94$ (BPP-40%). Correlations between 1-RM and SSP before and after training were $r = 0.55$ and $r = 0.61$ ($p<0.05$). Correlations between SSP and BPP ranged from $r = 0.40$ (BPP-80%) to $r = 0.62$ (BPP-60%). Changes in power relative to improvements in strength appeared to be greatest at the heavier loads. Improvements in muscle power performance of women are apparently related more specifically to the speed of exercise than to absolute gains in strength.

R 26. ***RELATIONSHIP OF BODY CATHEXIS AND SOMATOTYPE TO PHYSICAL FITNESS SCORES IN HIGH SCHOOL MALES AND FEMALES.*** M. Thissen-Milder and J. L. Mayhew. University of Iowa, Iowa City, IA, and Northeast Missouri State University, Kirksville, MO.

Self-concept is a mulit-dimensional integration of many aspects of an individual's life. In Physical Education, we often feel that a child's body image is directly related to his or her physical performance and that through changes in performance level, we can affect changes in self-concept. The purpose of this study was to determine the extent to which body image and somatotype were associated with physical fitness scores in high school boys and girls. The physical fitness levels of high school students (167 boys; 223 girls) were evaluated using the Physical Best test items of mile run (MR), 1-min situps (SU), sit-and-reach flexibility (SR), and pullups in males (PU) or bar hand in females (BH). Somatotype was estimated by the Heath-Carter procedure, and body cathexis was determined from a 28-item modified version of Jerrod and Secord scale. Boys were significantly taller, heavier, had less body fat (as estimated by sum of four skinfolds), less endomorphy, more mesomorphy, and more ectomorphy than girls. Boys showed significantly greater satisfaction with 15 of the 28 body cathexis items than did the girls. Age and height were not significantly related to any of the fitness performance items in boys, but height was negatively related to SR ($r = -0.23$) and BH ($r = -0.30$) in girls. Weight had a significantly negative influence on all fitness test items in both sexes. Endomorphy (holding mesomorphy and ectomorphy constant) was significantly related to MR time (boys, $r = 0.40$; girls, $r = 0.39$) and SU (boys, $r = -0.23$; girls, $r = -0.38$). Although endomorphy was not related to SR or PU in boys, it was negatively related to SR ($r = -0.15$) and BH ($r = -0.20$) in girls. Mesomorphy (holding endomorphy and ectomorphy constant) was not significantly related to any fitness items in boys; in girls, mesomorphy was negatively related to SR ($r = -0.27$) and BH ($r = -0.18$). Ectomorphy (holding endomorphy and mesomorphy constant) was significantly related to MR ($r = 0.18$) and PU ($r = 0.12$) in boys and to SU ($r = -0.13$) and SR ($r = -0.28$) in girls. Multiple regression analysis could prediction fitness performance items with moderate accuracy ($R = 0.38$ to 0.60) using morphological characteristics. There was little relationship between fitness scores and body cathexis in boys ($r = 0.08$), but there was a moderate and significant correlation in girls ($r = 0.30$). In conclusion, fitness test items appear to be more dependent on body structure than on body image in adolescent boys and girls, although there may be a greater relationship between fitness level and body image in girls than in boys.

R 27. ***THE USE OF PSYCHOLOGICAL SKILLS OF COLLEGE ATHLETES*** T. C. Hoffner & M. A. Parker, University of North Dakota; C. L. Pemberton, University of Missouri-Kansas City; H. Barber, University of North Dakota.

The use of psychological skills by athletes to enhance performance in practice and game settings has become accepted in

the last decade. However, little is known about the actual use of these skills by athletes. the purpose of this study was to determine the use of various psychological skills in relation to perceived ability, gender, and sport type. Male and femal intercollegiate athletes (N=217) completed a questionnaire on which they rated the frequency of use of five primary psychological skills: relaxation (REL), imagery (IM), goal setting (GS), concentration and attention control (CAC), and mental strategies (MS). Separate MANOVA's were conducted to determine if differences existed in the use of psychological skills between ability levels, genders, and individual and team sport participants. Significant differences were found between individuals who perceived themselves to be high and low in ability, $F(5,211) = 2.67$, $p=.023$. Follow-up analyses indicated that athletes perceiving themselves higher in ability used IM, GS, CAC, and MS to a greater extent than individuals lower in perceived ability. MANOVA indicated that significant differences also existed in the use of psychological skills between individual and team sport participants, $F(5,211)=2.89$, $p=.015$. Follow-up analyses indicated that team sport participants used GS, and CAC more frequently than individual sport participants. Analyses of gender differences in the use of psychological skills indicated that differences were evident between male and female athletes, $F(5,211)=2.20$, $p=.055$. While this multivariate F only approached significance, the results were considered important in light of the limited research on gender differences in this area. Follow-up analyses indicated that male athletes in this study used IM, CAC, and MS to a greater extent than female athletes. These findings will be discussed in relation to previous research on the use of psychological skills among collegiate athletes, specifically regarding to the use of psychological skills by individual and team sport participants.

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